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### Review Of "Embryonic And Fetal Development, Reproduction In Mammals" Edited By C. R. Austin And R. V. Short

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Review

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In conclusion, this is not the book that definitively welds ecology to population genetics. Rather, it is the book that shows what this long-sought synthesis should look like when it is finally accomplished.

MICHAEL E. GILPIN, *Biology, University of California at San Diego, La Jolla, California*

**CROP GENETIC RESOURCES—THE CONSERVATION OF DIFFICULT MATERIAL.** *Proceedings of an International Workshop held at the University of Reading, UK, 8–11 September, 1980 [sponsored by IUBS, IBPGR, and IGF (International Genetic Federation)]. International Union of Biological Sciences, Series B 42.*

*Edited by Lyndsey A. Withers and J. T. Williams. International Union of Biological Sciences, Paris; International Board for Plant Genetic Resources, Rome. \$15.00 (paper). xiv + 134 p.; ill.; subject and plant indexes. [Available from IUBS, Paris, and from L. A. Withers, Department of Agriculture & Horticulture, University of Nottingham, Loughborough, UK.] 1982.*

This volume, which contains the technological assessments and recommendations of an international workshop, begins with a laconic foreword and a well-organized introductory chapter by N. W. Simmonds. Following the introductory chapter are four review chapters; two of the reviews (on the mechanisms of freezing injury and on the storage of plant tissue cultures) are reasonably detailed and represent the only substantial manuscripts in the book. Following the review chapters are six summaries of discussion sessions covering several topics that are primarily related to cryopreservation and genetic stability. Included are discussions of the establishment of plant tissue cultures, genetic stability of stored tissue, membrane damage during dehydration and dessication, cold hardening to aid recovery of stored material, and storage via growth inhibition and dormancy. The volume concludes with a list of recommendations for future research.

In general, the workshop participants recognized that there is a major need for work on the preservation of short-lived seeds (primarily of tropical crops). The value of replacing experimental plantations with cell cultures or cryopreserved cells is obvious, because it reduces both the cost and the risk in preserving genetic information. Despite the obvious advantages of cryopreservation and plant cell culture, the widespread use of these techniques has not increased rapidly during the past two years. This limited application is a consequence in the difficulty of achieving reproducible, generalized procedures for cryopreservation, and of the problem of the genetic stability of plants regenerated from cell cultures.

Several features of the book deserve mention.

(1) This book was published nearly two years after the meeting was held; hence, many of the contributions and conclusions are somewhat out of date. (2) Several reports related to the cryopreservation of cultured plant meristems, in which the recovery of frozen plants has been attempted (for example, the work of K. Kartha and colleagues), have not been considered adequately. (3) Finally, it is somewhat annoying that in the introductory chapter Simmonds suggests that several terms in this field, such as "recalcitrant" species and "tissue" culture, are used indiscriminately and incorrectly; yet, surprisingly, the remaining chapters continue to use these terms incorrectly, as defined by Simmonds. The indexes are adequate; the subject index provides a useful source of information on important tropical crops.

DAVID A. EVANS, *DNA Plant Technology Corporation, Cinnaminson, New Jersey*

**ADVANCES IN CLADISTICS. Volume 2. Proceedings of the Second Meeting of the Willi Hennig Society [held at the University of Michigan, Ann Arbor, on October 1–4, 1981.]**

*Edited by Norman I. Platnick and V. A. Funk. Columbia University Press, New York. \$32.50. xi + 218 p.; ill.; index. 1983.*



## REPRODUCTION & DEVELOPMENT

**EMBRYONIC AND FETAL DEVELOPMENT.** *Reproduction in Mammals, Second Edition, Book 2.*

*Edited by C. R. Austin and R. V. Short; drawings by John R. Fuller. Cambridge University Press, Cambridge and New York. \$29.95. ix + 190 p.; ill.; index. 1982.*

For those of us who were beginning to think that mammalian embryology was synonymous with the development of humans and mice, this volume will provide a useful tonic. Rather than delve deeply into the development of a single exemplary species, as other excellent reviews have done, the authors of these chapters bring out the variations on the major themes of mammalian embryology. Thus, this relatively thin volume will introduce the undergraduate to ovulation in the fetal giraffe ("serving no useful purpose"), sex determination in the bandicoot (where the somatic cells of both sexes are XO), testosterone secretion in the female hyena, blastocyst formation in marsupials (no distinct inner cell mass), and the control of implantation in several species of bats, skunks, and kangaroos.

The book is divided into six chapters: "The Embryo" (McLaren), "Implantation and Placentation" (Renfree), "Sex Determination and Differentiation" (Short), "The Fetus and Birth" (Liggins), "Pregnancy Losses and Birth Defects" (Jacobs), and "Manipulation of Development" (Gardner). For the most part, the chapters are informative and informal (in some parts, even flip-pant). In so few pages, the authors can only outline the highlights of their fields, but they have chosen their topics well and present difficult material in a patient and logical manner. Although each of the chapters is self-contained, they all stress that mammalian embryos, because they develop within the confines of another organism, differ significantly from non-mammalian embryos and from adult mammals as well.

There are some defects, however, which detract somewhat from the general usefulness of this volume. The authors occasionally forget who their intended audience is and lapse into the convenient jargon of the profession (histamine H1 and H2 antagonists, blocking antibodies, and the *t<sup>12</sup>* and *c25H* mutations are mentioned but not defined). The breadth of this book sacrifices some of the most exciting details of recent murine studies. Nowhere is the embryonic cell surface treated; neither are the effects of the T-complex. Compaction is mentioned in a single sentence, and there is no diagram or photograph to help the student visualize this crucial event. This stimulating material could have been included if the other illustrations were made fewer and smaller.

For those studying mammalian development for the first time, this book will provide an excellent introduction to its major principles. For those already familiar with the field, this volume includes the object lesson of Leonardo da Vinci, who completed his anatomically outstanding illustration of the human fetus by surrounding it with the cotyledonous placenta of a cow. "His act serves as a warning to those who make unwarranted interspecific comparisons" (p. 60).

SCOTT F. GILBERT, *Biology, Swarthmore College, Swarthmore, Pennsylvania*

THE MOLECULAR BIOLOGY OF PLANT DEVELOPMENT. *Botanical Monographs, Volume 18.*

*Edited by H. Smith and D. Grierson; Series Editors: J. H. Burnett, H. G. Baker, H. Beevers, and F. R. Whalley. Published for Blackwell Scientific Publications by University of California Press, Berkeley. \$65.00. xiv + 617 p.; ill.; index. 1982.*

This volume is among the first of its kind to serve as a basic textbook for the field of modern molecular plant biology. The introductory chapters review the relevant concepts from a botanical perspective. Extensive coverage is given to general

processes, from cellular events, such as transcription and translation, through coordinating mechanisms, especially those involving growth substances. A good understanding of basic biochemistry is required of the reader, however.

Later sections of the book review specific developmental avenues, including seed maturation and deposition of storage proteins, gravitropism and phototropism, and leaf senescence. Developmental aspects of a variety of well-studied systems, among which are *Fucus*, *Acetabularia*, *Rhizobium* and fungal infections, are also covered. These chapters tend to revolve around the more classical areas of research, but other topics, such as nucleic acid and protein synthesis during seed germination, go deeply into the now-popular molecular techniques.

One potential shortcoming of this volume is that only a single and comparatively short section is devoted to the relevance of crown gall research to developmental biology. It gives a very brief but articulate review of the system, followed by a detailed review of some of the recent major breakthroughs that link the transformation, effected by a bacterial plasmid DNA, to the apparent alteration in the metabolism of auxins and cytokinins. The brevity in dealing with other advances in this field might, however, leave the reader without a full appreciation of the magnitude and the fervor that research in this field is currently enjoying.

It is also a bit disappointing that a book of this sort does not cover the work that has been done on transposable elements in maize. While it is still a developing and controversial field, this is a rare example in which plant research has been the absolute pioneer in an area that is now becoming of widespread interest throughout developmental biology.

The above-mentioned omissions notwithstanding, this volume could easily serve as a textbook for an introductory course in this field, and should also be kept within the reach of anyone who has an interest in plant molecular biology. It contains enough background material to make it a durable resource in what promises to be a rapidly advancing science.

KEVIN KELLY, *Biochemistry, State University of New York, Stony Brook, New York*

BIOCHEMISTRY OF DIFFERENTIATION AND MORPHOGENESIS. 33. *Colloquium der Gesellschaft für Biologische Chemie, 25-27 März, 1982, in Mosbach/Baden.*

*Edited by L. Jaenicke. Springer-Verlag, Berlin and New York. \$37.00. xi + 301 p.; ill.; subject index. 1982.*

This collection of twenty-six research papers is divided into five sections. The first section contains